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ABSTRACT

Intended as a practical introduction to training for British business people whose jobs involve providing training but who are not full-time trainers, this document discusses the principles of effective instruction and the practical implications of such instruction. The introduction: (1) argues that effective instructors are made, not born; and (2) lists effective instructor style characteristics (developing a rapport with trainees, having a flexible approach to accommodate individual needs, and adapting to different types of learning). The bulk of the document explains effective instructor style techniques, which include having clear objectives, taking into account different kinds of learning, using alternative training strategies, recognizing that trainees have more than one learning need, talking less but more effectively, inviting participation, encouraging trainee independence, appraising progress, having strategies for error correction, diagnosing errors by questioning the trainee, checking the effectiveness of instruction, and using time well. The document concludes with a summary of good instructional practice and appendices that describe a study of instructor effectiveness, an explanation of methods to help prevent errors in what is to be learned, a quiz that asks readers when they would correct particular kinds of errors frequently made by trainees, and answers to the quiz. (CML)

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Effective Instruction

A practical guide to the principles involved

Vivien Fleck and Carol Law

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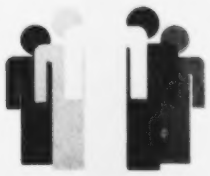

INDUSTRIAL TRAINING RESEARCH UNIT

Effective Instruction

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EFFECTIVE INSTRUCTION

Introduction

Contents of this book

This booklet discusses the principles of effective instruction and their practical implications.

Who should read it?

As a practical introduction to training, the booklet will be of interest to anyone with an element of training in their job, for example, a supervisor training new employees, a manager developing staff or a part-time trainer in a small company.

What it excludes

Of necessity, explanations are brief and detailed help in applying the principles to your own training cannot be given.

Additional help

ITRU has produced a workbook entitled 'Helping People Learn' which aims to give you an awareness of how people learn, and then to help you plan and run your training sessions so that you are not only helping people learn, but also helping them become independent learners.

In conjunction with Audi Volkswagen ITRU has produced a series of audio tapes which identify effective instruction techniques and provide examples of these methods being used by instructors. A workbook is also available which contains a number of exercises to help you assess and improve your instruction.

Effective Instructors are "made" not "born"

ITRU research on instructor effectiveness was conducted for several years under the title "POISE", a mnemonic for "Project on Instructor Style Effectiveness". Appendix I gives more detailed information about the research programme. It was observed that two instructors might be following the same training plan, using the same visual aids, and teaching trainees of similar calibre, and yet have very different success rates. The difference between them lay in the detail of HOW they put across information and dealt with errors. This difference was called their "instructional style". The project examined instructor style characteristics (what qualities instructors possessed) and instructor style techniques (what instructors do and how they do it); in particular those style techniques practised by effective instructors. The results of ITRU research refute the doctrine that professes that effective instructors have some divine gift denied other men. In fact effective instructors are "made" not "born". The techniques identified can be studied, learnt and practised.

Instructor Style Characteristics

An instructor's overall approach to training is demonstrated through his style characteristics. Observation of effective and less effective instructors enabled ITRU to identify those style characteristics which are important to effective instruction. They are: developing a rapport with trainees, having a flexible approach in order to accommodate the individual needs of trainees, and adapting to the different types of learning a job involves - in short effective instructors may be described as having a trainee-centred approach to training.

Instructional Style Techniques

Various style techniques employed by effective instructors were identified. It was through the employment of these techniques that these instructors manifested their style characteristics and thus their overall trainee-centred approach to training. If you are prepared to study, learn and practise some, or all of these techniques, you will be able to adopt a more effective instructional style.

The next section of the booklet discusses each style technique in more detail.

Style Techniques

Effective instructors .....
.....have clear objectives

Learning objectives

Effective instructors recognise that learning must have a clear objective which enables the instructor to measure whether or not learning has taken place. These must include not only what the trainee will be able to do at the end of training but how well he must do it, i.e. performance standards.

Instructors' long and short term objectives

For the trainees to achieve effective learning, measured by meeting learning objectives, the instructor must have clear long and short term goals of instruction. Less effective instructors do not appear to have these.

Style techniques to establish objectives

Effective instructors make sure that the long term objectives of a training session are stated clearly at the start. This ensures that the trainee is tuned to the right wavelength straight away, so he is prepared for the instruction that follows. Effective instructors make use of short term objectives which tell the trainee what he should be aiming at in the next few minutes; for example "We want to weld these two pieces of metal together at right angles to each other". By doing this the effective instructor provides a framework in which the trainee can organise the information to be remembered.

Effective instructors .....
.....take into account different kinds of learning

Five kinds of learning

The ITRU booklet 'CRAMP' describes five kinds of learning:

C – comprehension
R – reflex action
A – attitude learning
M – memorisation
P – procedural learning

Learning a task usually requires several of these types of learning.

Appropriate training approaches

Different training approaches are appropriate to each kind of learning e.g. an expository or instructor-centred approach, a collaborative or group approach, an individual approach.

Training methods

Each training approach can employ a variety of training methods e.g. an expository teaching may use a lecture, demonstration or seminar method. The choice of training method depends on the nature of the task to be learned.

Strategy for linking training and learning

Effective instructors consider what kind of learning is involved at each stage of training for the trainee and choose an appropriate training approach. Awareness of the nature of the learning is fundamental to effective instruction.

The ITRU booklet 'CRAMP' will provide you with all the information you need to produce an effective strategy to link training and learning.

Reason for using alternative strategies

Trainees have individual learning needs and preferences. If these are not met, they find learning a slower and more difficult process.

Techniques for taking individual differences into account

Effective instructors take individual differences into account by:

1. Teaching in groups of 3 trainees or less from the start.
2. As soon as possible, attending to each trainee individually.
3. Fitting their teaching approach and method to each trainee. This usually means that they must try alternative approaches until the trainee is able to understand and perform the task.
4. Diagnosing individual learning problems and identifying possible remedies.
5. Recognising that their instruction may be responsible for a trainee's learning problems and that this, rather than the trainee, may need changing.

Choosing an alternative method

An effective instructor first identifies which part of the task is causing the difficulty. This is classified as comprehension, reflex, attitude, memorisation or procedural learning, and an alternative training approach and method suitable for the nature of the task and learning required can be chosen. The ITRU booklet 'CRAMP' describes this in greater detail.

Some trainees find it difficult to learn from verbal and visual demonstrations. Effective instructors use an alternative such as touch (or kinaesthetic guidance) to supply the feel of something the trainee has not been able to discover by watching or listening, for example, changing gear.

One approach does not take into account individual differences

Less effective instructors tend to repeat their first training approach despite evidence that it has not worked. For example they may repeat a demonstration, direct the trainees what to do, give general rather than specific advice or ask the trainee a general question: "What don't you understand?"

They often assume that the error is the trainee's fault rather than their own instructional approach or omission.

Effective instructors .....

.....recognise that trainees have more than one learning need

Other learning acquired in a training course

Especially if starting work for the first time, trainees need to learn what is acceptable to the organisation e.g. quality standards, behaviour, dress.

Training is a method of getting across to all participants company attitudes, expectations, atmosphere, changes, policies etc. in addition to the basic content of the training programme.

Accustoming new trainees to the company

Effective instructors devote learning and reflection time to such issues during the training programme. Techniques used when training newcomers to the company include:

1. Helping trainees to develop a pride in their work by putting the onus on them to appraise it.
2. Ensuring that the training programme accustoms trainees to the constraints and demands of their future jobs e.g. to periods of close attention to detail, or to the need to take the initiative.
3. Allowing trainees time at an early stage to absorb their potentially distracting surroundings (people, noise, equipment), perhaps by demonstrating the learning task to small groups and allowing the other trainees to remain 'idle'.

The instructor's influence on the organisation

They are aware that their own style characteristics and techniques condition how each employee views the organisation, colleagues and work itself. Through the attitudes acquired by the trainee during training, the approach of the instructor can shape the social climate of the organisation itself.

Effective instructors .....
.....talk less but talk more effectively

The nature of talk

The "gift of the gab" is *not* a characteristic of an effective instructor. Effective instructors have an appreciation of the nature of talk and its effect on learning at different stages of training.

Amount of talk

Less effective instructors are more verbose throughout training although those observed in the research studies became progressively less talkative as training continued.
Effective instructors overall speak less.

Style techniques

Effective instructors keep their talk to a minimum:

1. They avoid overloading trainees with advice and information about
   - why something is done
   - what not to do
   - complex facts
   - technical names or jargon
   - possible difficulties

2. At the beginning of training they do not try to teach the whole job at once, but concentrate on teaching the basics first. In this way they avoid overloading the trainee's memory and confusing him.

3. Effective instructors avoid repeating themselves, as well as giving a running commentary (prompting unnecessarily) when the trainee attempts to do the job. A running commentary is distracting for the trainee and encourages him to rely on the instructor to tell him what to do at each stage.

4. When effective instructors give a demonstration, they first of all explain briefly what they are going to do, mentioning the key points which the trainee should watch. They then demonstrate *silently* so that the trainee can concentrate on what the instructor is doing. The unpractised eye of the trainee cannot easily identify what the instructor wants him to see. He must be able to concentrate fully during a demonstration.

Silence

All effective instructors allow their trainees periods to reflect on and to digest what has been taught, without additional explanation or questioning. Such periods of reflection are required frequently throughout training.

Effective instructors .....
.....invite participation

Reasons for inviting participation

The style techniques used by effective instructors to invite participation are crucial in building a rapport with the trainee and in ensuring that learning is trainee-centred.
Most experienced instructors aim to encourage trainee initiative in learning.

Style techniques to ensure trainee participates in learning

Effective instructors ensure that the trainee is mentally active throughout training by the following methods:

1. Ask teaching questions

1. They ask questions of the trainee in order that he establishes for himself some of the new information he must acquire. The questions are pitched at the right level so that the trainee has every opportunity to get them right.

2a. Ask specific questions...

2a. After the initial explanation or demonstration they ask the trainee specific questions such as "What are you going to do first?" "How will you keep the pieces aligned?"

2b. ...or exchange places

2b. Alternatively they exchange roles with the trainee saying, "Now you tell me how to do it." If the trainee omits anything the instructor stops and prompts: "What have you forgotten?" "How do I do that?"

3. Watch entire task

3. They then watch the trainee perform the entire task.

How this ensures the trainee's participation in learning

1. Questioning the trainee checks that instruction has been understood and involves the trainee.
2. Listening to the trainee's responses indicates possible learning problems.
3. Responding to the trainee's answers builds rapport and clears up problems.
4. The trainee is helped to succeed first time and to avoid serious errors.
5. Early success and involvement enhances enthusiasm.
6. Fewer errors at the start enable the trainee to move on to the next step after a shorter period of practice.

Failing to ensure trainee participation

Less effective instructors often think that they are involving trainees mentally and physically, but their style techniques are ineffective.

1. **Danger of general questions**

1. They ask general questions such as: "Is there anything you don't understand?" Most trainees fail to respond from either diffidence or from not realising that they don't understand.

2. **No demonstration results in dependence**

2. They get the trainee to perform the task immediately without a preamble or demonstration. Although physical participation is achieved, the mental involvement required for effective learning is not. The trainee does not know what to do and has to rely on step-by-step directions. From the beginning the trainee is dependent on the instructor's cues and finds it difficult to remember the sequence of tasks.

3. **Unlearning a wrong guess**

3. Another risk in this approach is that the trainee has to guess what to do to achieve the objectives. This apparently encourages initiative and mental participation, but in effect the trainee is likely to guess wrongly. Although the instructor may correct the errors, they result from the learner's own decision and therefore carry a high level of commitment. Unlearning such an error is difficult.

Effective instructors .....
.....encourage trainee independence

Reasons for encouraging trainee independence

Training aims to enable the trainee to perform the job unfailingly to the quality standards required without the support of the instructor or supervisor. The trainees will be expected to use their initiative to cope with variations in the tasks they perform. This is best achieved by encouraging trainee independence at an early stage of training.

Style techniques to encourage independence

Encouraging independence is a prime objective of effective instructors, achieved through a variety of style techniques.

1. **Trainee works unaided**
   1. As far as possible after the initial explanation and demonstration they allow the trainee to perform the task unaided.
2. **Prompt rather than tell**
   2. They use the cause of the trainee's hesitation to ask questions which prompt the trainee to remember or work out what to do next e.g. "Look at the model if you can't remember where the resistor should go".
3. **Trainees undo mistakes**
   3. Trainees undo and rectify their own mistakes.
4. **Trainee works out cause of error**
   4. At an advanced stage of training they question the trainee about the cause of errors. This requires initiative in accounting for mistakes and the trainee gets better at dealing with problems (see pages 16 to 19).
5. **Trainee assesses work**
   5. From the start of training they rely on the trainee to assess when the work is ready for inspection. The trainee has to decide whether it needs further work before inspection.
6. **Trainee comments on quality**
   6. The trainee is asked to comment on the quality of work before the instructor does so. This develops the trainee's ability to distinguish between good and indifferent work and to appreciate the quality standards required. (It also increases self-esteem and involvement.)
7. **Solve problems without instructor**
   7. Trainees are expected to solve their own problems alone or in consultation with other trainees, once basic training is finished. They develop the ability to judge when help must be sought rather than demanding attention.
8. **Instructor does not offer help later in training**
   8. As the trainees improve, the instructor spends time with them only when they indicate they need help.

Failure to encourage independence	Less effective instructors do not consider trainee independence to be an objective. Their concern is often to protect the trainee from error. They may unconciously prefer instructor-centred learning where they feel 'needed' by the trainees.
1. Directive	1. Instructors, while introducing the trainee to the task tend to be directive, although often give succinct and complete instructions.
2. Reminders	2. Reminders of how the task should be done are given during observation (encourages dependency and risks frustration).
3. Demoralisation after cues	3. After early successful attempts because of directives it can be demoralising if the trainee cannot later do the task unaided.
4. Undo work	4. Less effective instructors often undo poor work (considering it more important for the trainee to spend time 'doing').
5. Rectify work	5. Alternatively, they rectify it themselves.
6. Judge/guess when work is finished	6. They judge when to inspect the trainee's work. The trainee therefore learns to leave quality appraisal to the instructor.
7. Encourage trainees to bring problems	7. They encourage trainees to come to them and deal with problems immediately, even if this means interrupting the early training of another trainee.
8. Apportion time equally	8. They tend to give each trainee the same amount of time and attention by checking how they are getting on, whether the trainee is new or advanced, and whether it is needed or not.

Effective instructors .....
.....appraise progress

Informing trainees of progress

Praise and criticism are not sufficient to inform trainees of their progress. Objective appraisal is needed.

Style techniques in appraising progress

Effective instructors use a variety of style techniques:

1. **Overall progress**

1. They encourage trainees by referring to overall progress rather than passing verdicts on small stages of the work e.g. "You are just about on schedule so you can take your time practising that".

2. **Joint discussion**

2. They initiate joint discussions of progress, and how overall it reaches expectation which puts small successes and failures into proportion.

3. **Specific suggestions and challenges**

3. Their talk includes specific suggestions on how to improve and encourage challenges (e.g. try to do x a bit faster now).

4. **Progress linked to appraisal**

4. Inspection sessions are used to determine whether the trainees can start the next stage, so progress is linked to appraisal.

Problems in using praise and criticism

Less effective instructors tend to praise or criticise performance of small stages of training. They do not use the appraisal to decide whether the trainee is ready to move on, but advance the trainee according to their own timetable. If praise is not supported by the trainees observation of the quality of performance, the trainee's confidence ebbs and respect for the instructor diminishes.

Effective instructors .....
.....have strategies for error correction

Types of learning and error correction

Strategies for error correction are based on an understanding of what type of learning is taking place at each stage of training. The ITRU booklet, CRAMP, describes five kinds of learning: Comprehension, Reflex Action, Attitude development, Memorisation and Procedural learning, and explains how these are used in numerous teaching approaches and teaching methods.

Basic questions to select a strategy

For error correction to be entirely successful, the learning component of the task must be identified. Less effective instructors tend to assume that the same kind of learning operates throughout the training programme, and therefore correct all errors in the same way. Effective instructors ask themselves these basic questions to select a strategy.

1. When should I respond to the error
2. How should I respond to the error
3. Why did the error occur?

Strategies for *when* to correct an error

When a trainee makes a mistake, the instructor has three options:

a) Act immediately
b) Take no action
c) Delay action until later.

a) Immediately
- safety
- manipulative or memorising tasks

Effective instructors act immediately

* when safety is concerned
* when errors occur in manipulative skills or in memorising a fact or procedure.

b) Take no action

Effective instructors take no action

* when a learner's first attempts fall short of the correct standard because of lack of practice.

c) Delay error correction

Effective instructors delay error correction or comment

* when experience of the consequences of an error could help a trainee to learn a principle which needs to be understood (except when safety is concerned).

Strategies for *how* to correct error

The type of learning involved also conditions how to respond to an error.

Immediately - safety

Effective instructors ensure the safety of their trainees by

* stopping the trainee with a sharp command
* then reinforcing the message with questioning.

This strategy modifies the trainees' behaviour and forces them to think out what they have done wrong and why it is dangerous. They are more likely to remember and understand the implications if they are not merely told the answer.

- Manipulative and memorising tasks

If the error is not pointed out immediately the trainee will assume it was right and will have difficulty in 'unlearning' it later. Effective instructors protect trainees from errors in the early stages of training but question the trainee until he reaches the right decision if he hesitates. If an error occurs they check:

1. Does the trainee know he is at fault?
2. Does the trainee know what the fault is?

Specific but concise directions often follow the questions so that the trainee knows exactly what to do in the next attempt, and this is watched carefully by the instructor.

Less effective instructors

* Allow unnecessary errors to happen and then correct them.
* Overload the trainee with general advice about why the error was made which confuses the trainee and can be dangerous if the trainee needs to concentrate.
* Delay error correction even in the early stages, perhaps to avoid disheartening the trainee. This often results in the trainee repeating the errors.
* Alternatively they merely alert the trainee to the mistake without ensuring that he knows what to do to avoid it in the future.

Strategies for how to correct error
No action when caused by lack of practice

Drawing attention to faults due to lack of practice may destroy the trainee's confidence and any rapport with the instructor.
Less effective instructors insist on work reaching a required standard before the trainee has been able to practise and appraise the quality of the work.

Strategies for how to correct error
Delayed correction

Delayed error correction is used when learning is conceptual rather than manipulative or memorisation. Once the learner has mastered the manipulative and memorising competences, the next stage is usually to learn how they are applied to operational work or to a variety of situations.

Effective instructors allow the trainee progressively more freedom to make mistakes as understanding increases, so that finally each mistake improves understanding of the job. They check; in addition to 1 and 2 above:

3. Does the trainee know why the fault occurred.
4. Does the trainee know how to overcome it?

Danger of explaining errors

Ineffective instructors continue to explain the mistake so the trainee tends to try and memorise the explanation rather than thinking out the cause of the error and developing a strategy to deal with it. An explanation at this point hampers flexibility and a high level of future performance.

Strategies for error correction towards the end of training

In the final stages of training, good instructors rely on alerting the trainee to an error. Because they are confident that early training was effective they can assume that the trainee is capable of understanding and thinking through mistakes when alerted.

Possible causes of error in performance

1. Trainee has not been taught the procedure.
2. Trainee has been taught the procedure but was not attending.
3. Trainee was taught the procedure, was attending, but misunderstood it.
4. Trainee understood it but has forgotten.
5. Trainee has not had sufficient practice in the relevant manual and perceptive skills.
6. Trainee lacks some specific perceptual or motor ability needed for the job.

Appendix II lists types of learning and methods to help prevent errors occurring or recurring.

Appendix III consists of a quiz to help you develop a strategy for error correction.

Effective instructors .....
.....diagnose errors by questioning the trainee

Causes of errors

The cause of an error is not always the most obvious one.

Style techniques for diagnosing errors

Effective instructors:

1. Ask the trainee what he has done and why.
2. Then ask the trainee to suggest what he could do to prevent a recurrence (i.e. they involve the trainee).
3. Find out all the facts about the problem before deciding on the cause.
4. Develop a hypothesis about the cause and decide whether it sounds feasible.
5. Act on the idea and then check that their efforts to help the trainee to overcome the problem have been effective.
6. Consider what they can do to improve their own instruction.

How not to do it!

Less effective instructors tend to jump to conclusions about the trainee's error, for example "I think you are doing x...." They then explain to the trainee waht appears to have been done or omitted and how it should have been done. This does not tackle the basic problem.

The instruction may cause several trainees the same problem

When a trainee makes a mistake it is not necessarily the result of inattention, incomprehension or forgetting. How the instructor gave the original instruction may be the problem, especially if several trainees have the same difficulty.

Questioning the trainee, and working out what is wrong

As part of their strategy for diagnosing the causes of errors, effective instructors question their trainees to ascertain how well they understand what they have been taught. This can be:

1. After immediate error correction.
2. During discussion prompted by delayed error correction.
3. During inspection sessions.

When the questioning is followed up by dealing with the trainee's difficulties, rather than treated as a test, the trainee is more likely to be relaxed and involved in the learning. Obviously the instructor then has to use the replies to work out where the instruction is faulty.

Effective instructors .....
.....use time well

Need for effective time management

In addition to supervising the learning of a number of trainees, instructors have demands on their time: the identification of training needs, the preparation of materials, other job responsibilities if they are supervisors or part-time trainers.
While training, time management must be effective if the instructor is to succeed.

Strategies for effective time management

Effective instructors use these among other strategies to help them to control demands on their time.

1. Subgroups

1. They never treat all new starters as one large group.

   From the beginning the group is split up into sub-groups of no more than three trainees, and only brought together occasionally.

2. No large groups

2. They drop group teaching completely much earlier than do their less successful colleagues.

3. Trainee independence

3. They encourage trainee independence in resolving their own problems and recognising when help must be sought (see pages 10-11).

4. Firm foundations of learning

4. They ensure that the foundations of learning are firmly laid for each individual in the way each needs at the start of training. This reduces the number of questions asked by the trainee later in training and gives the instructor more time.

5. No interruptions

5. They do not allow interruptions when attending to an individual trainee but encourage trainees to sort out problems for themselves or to consult another trainee.

Effects of lack of strategy

Less effective instructors are more likely to demonstrate or pass information to large groups, thereby ostensibly involving all the trainees but actually ensuring that most of the group will need considerable individual help later due to not having seen the demonstration properly or having failed to understand the information.
They also tend to deal with trainee's problems immediately, breaking off even from instructing another trainee which encourages the first trainee to interrupt again and confuses the second trainee.

Summary

Good Instructional Practice

CHECK THAT YOU ARE:

1. Using the language that the trainees can understand. The terms so familiar to you may be strange to them.

2. Not assuming knowledge or experience that trainees do not have.

3. Using the learner's previous experience and interests to make links between new information and existing knowledge.

4. Not overloading the new trainee with information and that you are concentrating on 'what must be known' and leaving 'what should be known' and 'what it's nice to know' until the basic information is firmly established.

5. Making the material sufficiently detailed to make clear all the necessary information.

6. Avoiding interference. If there are lengthy instructions to remember involve learners in applying each point as soon as possible. The reinforcement of learning in this way means that subsequent instructions will not confuse earlier instructions.

7. Helping trainees to remember by such aids as lists, mnemonics, part learning, associations, groupings and tests.

8. Helping to develop manual skills by demonstrations, physical guidance, practice and exercises.

9. Helping to develop perceptual skills by examples, discrimination exercises and practice.

10. Helping them to understand the meaning of what they are doing by questioning, setting problems or exchanging roles.

11. Getting trainees to show in an appropriate way that the instructions have been followed. Manual and perceptual skills can be demonstrated by the trainee, but understanding should be tested by giving a different but comparable task.

12. Comparable errors at the right time and in the right way.

REMEMBER ERRORS ARE HELPFUL IF THEY CAN BE USED TO ENHANCE THE UNDERSTANDING OF TRAINEES BUT HARMFUL IF THEY CONSOLIDATE WRONG ACTIONS OR REINFORCE INCORRECT RECALL.

Appendix I

THE LONDON TRANSPORT PROJECT

The instructor effectiveness ideas and methods were first developed in 1971 while studying the training of bus drivers at London Transport. A number of the instructors obtained a higher PSV driving test pass rate among their trainees than their collegues, although all followed the basic training programme. It was hypothesised that how they put across their instruction, i.e. their *style*, rather than what they taught made the difference.

The study

The training programme covered the basic training - reflex learning and memorising in handling a bus and learning road signs and the highway code, and operational training - the competences of comprehension in acquiring road sense, and attitude development as the new driver learned what was expected of him by the company. Most of the training took place on the road. Two (occasionally three) trainees were allocated to each instructor. A preliminary study identified three ways in which the style of instructors could vary.

1. The amount of talk
2. The purpose of the talk
3. The time and method of correcting errors

The styles of 20 instructors were then observed in half day training sessions over a three week period of training. Everything said by instructor and trainees was recorded and categorised according to its purpose. After considerable refinements made in this and later studies, all remarks were able to be classified under one of the following headings.

Poise Categories

1. Intentions and objectives
2. Facts
3. Procedures
4. Trainee has a go
5. Explanation (of intentions, facts, procedures)
6. Check questions
7. Running commentary
8. Opinions
9. Explanation of Opinions
10. Follow-up technique
11. Seeing error - Before

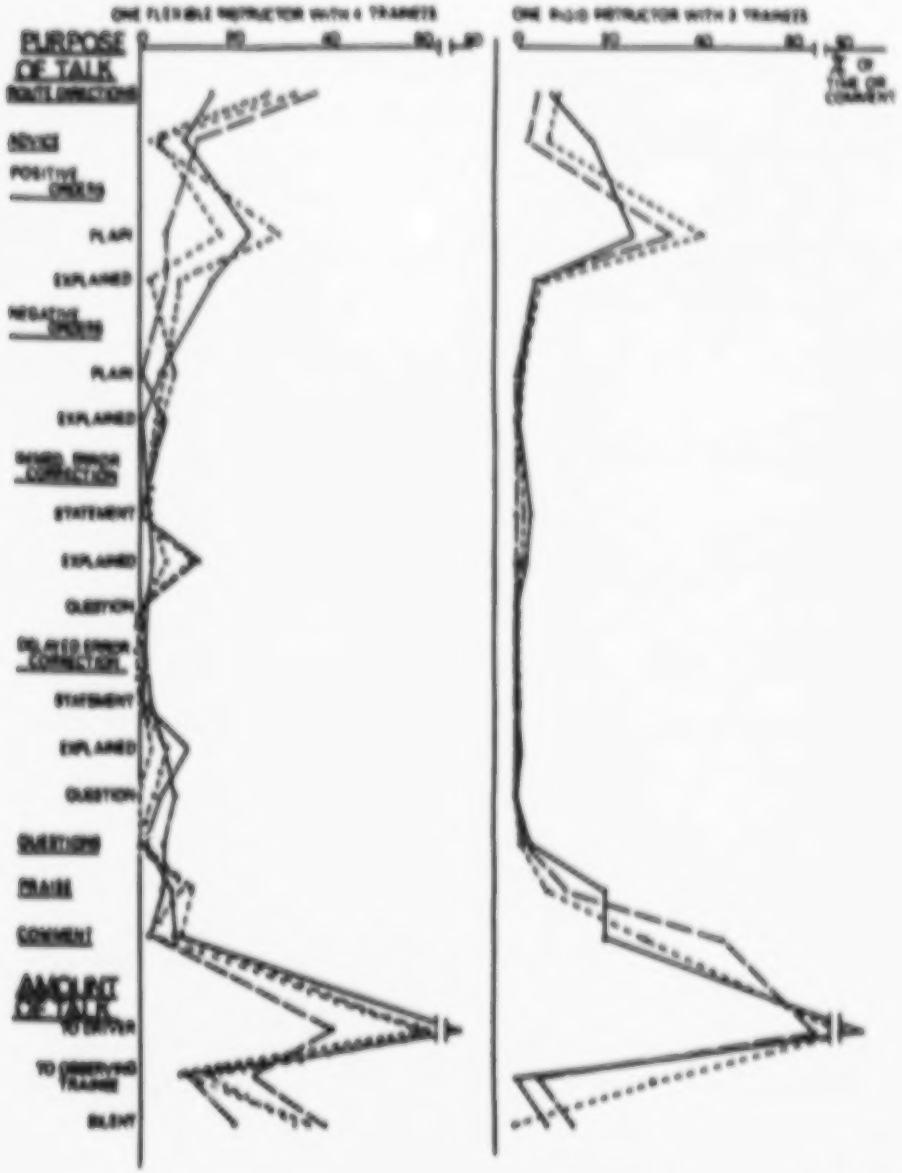
12,13,14. Error - What, How and Timing

15. Preventing future errors
16. Explanation of error

Other
Directions
Repeats
Trainee initiated comments

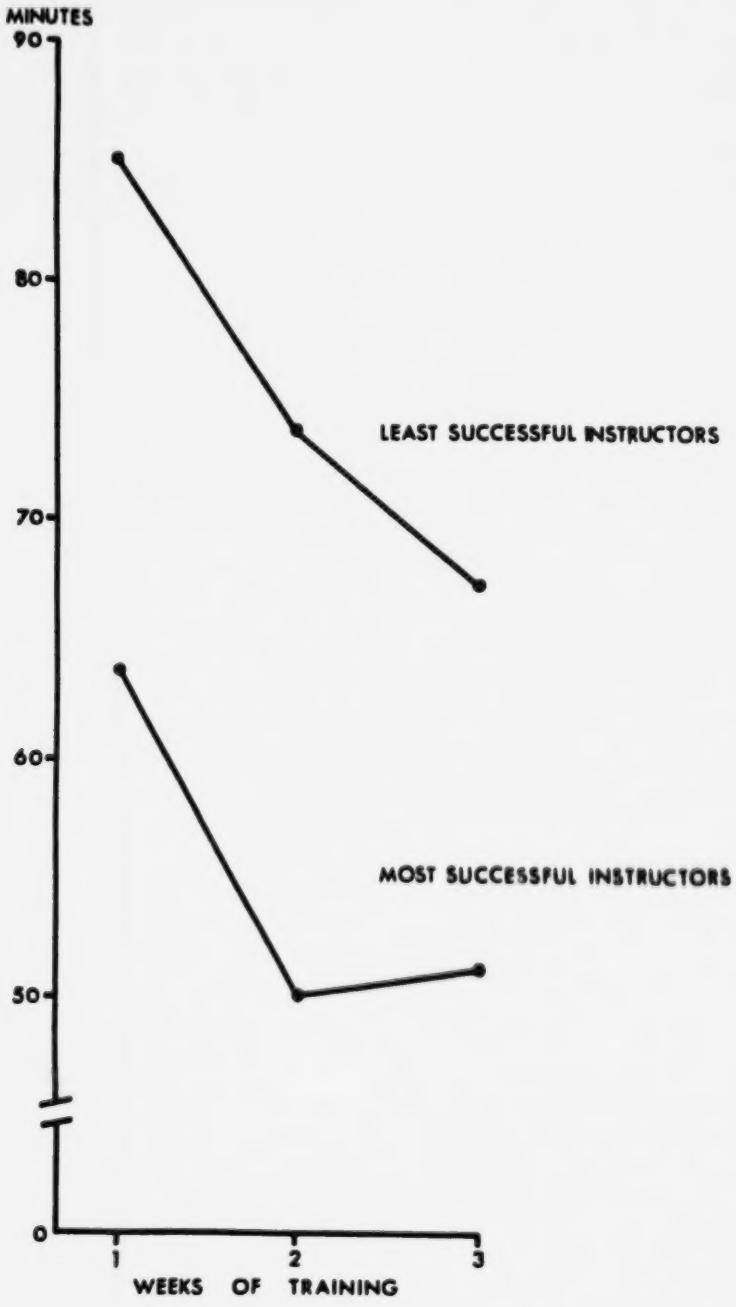
This produced profiles of the individual instructors, which fell into two main groups. Figure 1, using the early categories, demonstrates the profiles typical of each group. They differed in the degree of flexibility they shared. The more rigid group tended to treat all trainees alike at each stage of training: the more flexible group used relatively varied remarks for each trainee. A high trainee pass rate was linked to flexibility.

Figure 1
ACTUAL PROFILES OF STYLE OF A FLEXIBLE AND A RIGID INSTRUCTOR DURING THE FIRST WEEK OF INSTRUCTION



Other, quantitative, differences became apparent from further analysis. The most striking difference between high and low pass rate instructors was in the amount they talked. Overall, high pass rate instructors talked less. The amount they talked varied with the stage of training. It was highest in the first week, least in the second and showed a slight increase over the second week in the third. Lower pass rate instructors talked more at each stage, but progressively reduced the amount they said.

Figure 2.
MEDIAN PERCENTAGE OF MINUTES IN WHICH INSTRUCTORS SPOKE TO THEIR TRAINEE DRIVERS



The purpose of what they said varied. Giving orders formed a large proportion of the less effective instructors' remarks throughout training. The more effective group also gave orders, but they tended to be route directions and the number of direct orders they used decreased over the weeks. The researchers concluded that the more effective instructors allowed the trainees more freedom in learning and did not protect them from making errors by close instruction.

The way in which they corrected errors differentiated the group particularly after the first week of training. Both groups spent about the same proportion of time correcting errors. The more effective instructors corrected errors according to the nature of the learning taking place. Early in training when reflex actions were being learned, errors were picked up immediately and explained to prevent the error from becoming a habit. Later when the trainee was learning road sense, the more successful instructors delayed correction and questioned the trainees until they themselves worked out what was wrong. They did not explain. Less successful instructors increased their proportion of immediate error correction each week, and at each stage tended to explain the error to the trainee.

This explanation/questioning variation became the basis of the POISE feeding/demanding concept. In a *feeding* style, the instructor tells the trainee what to do, gives facts and advice. The opposite, the *demanding* style, helps an instructor to involve the trainee mentally by questions and prompts. Any remark can be couched in either the feeding style or the demanding style. It is possible to have a good and challenging feeding style which involves the trainee and results in effective instruction, but the majority of good instructors rely on a demanding style, 'feeding' only when appropriate.

This was confirmed in the London Transport project by measuring the participation rate of the trainees who were 'observing' while their partners drove. This rate was obtained by calculating the contributions made by the observer as a percentage of the sum of total comments made by him *and* addressed to him by the instructor. The most successful instructors elicited considerably more participation than their less successful colleagues. (Table 1)

Table 1
COMPARISON OF TRAINEE PARTICIPATION ELICITED BY DIFFERENT GROUPS OF INSTRUCTORS

	Medicans of trainee response rate at each stage of training		
Instructor classification	1st week	2nd week	3rd week
Most successful	36	35	45
Least successful	19	28	29

The researchers suggested that the higher participation rate achieved by the more successful instructors demonstrated that the trainees had been encouraged to think to become independent from the start, and to think for themselves - essential skills for managing the more difficult stages of conceptual learning.

Another consequence of the feeding style is likely to be overloading the trainee with information, especially in the early stages when he needs to concentrate on handling the bus safely. In addition to the possible danger of distracting the trainee, too much information too early leads to confusion and error at a later stage. In the final week of the programme, less effective instructors often started explaining what was wrong all over again. Trainees taught by more effective instructors did not suffer from overload. Instead, their instructors ensured that they had assimilated the facts necessary to avoid basic errors and then encouraged them to work out their errors themselves.

The pass rates of the trainees were predicted from the observed style characteristics and style techniques of the instructors.

The results were encouraging. London Transport adopted the Instructor Effectiveness system, and many of the specific recommendations about the content of the training programme made by the researchers.

Appendix II

	TRAINING AIDS	METHODS TO HELP PREVENT ERRORS OCCURRING OR RECURRING
I FACTS OR PROCEDURES TO BE MEMORISED	**Labelling**	Put names on articles to be learned, e.g. label parts of an engine, or the names of weaves.
	Numbering	Where the order in which a sequence is be performed is important, number the parts, e.g. the sequence for starting up a lathe.
	Associations	Groups things which are similar, e.g. it costs the same to send an airmail letter to Argentina, Canada, Kenya and South Africa. Ask the trainee to think of something which is familiar and link it with the new facts, e.g. "The indicators on a car are usually controlled from a stick near the wheel, on the bus they are here".
	Mnemonics and Jingles	These are helpful when material has to be recalled in a specific order. They usually take the form of an easily remembered word, phrase or formula, e.g. to learn the colours of the spectrum Red, Orange, Yellow, Green, Blue, Indigo, Violet. ROYGBIV Richard of York Gained Battles in Vain. Trainers should encourage trainees to make up their own mnemonics or rhymes.
	Part Learning	If there is a lot to be memorised break it down into parts. Get your trainee to learn each part thoroughly before going on to the next part. It is helpful to encourage trainees to revise the first part while learning the second part (Cumulative Part Learning). Alternatively, get the trainees to test themselves on the first two parts before going on to the next part (Progressive Part Learning). Learning all the parts separately before testing (Pure Part Learning) is NOT a good method

	Testing and Self-testing	Any form of testing used in combination with repetition and part learning is particularly helpful.
II MANUAL SKILLS	**Exercises**	These can be helpful to build up the necessary muscles, e.g. finger exercises in typing.
	Demonstration	Give a demonstration *after* you have explained what you are going to do so that trainees can concentrate on watching rather than watch and listen at the same time.
	Role Playing	Follow a demonstration by asking the trainee to tell you what to do and how to do it whilst you carry out the instructions given.
	Simplification	Build up speed by habituating the trainee to fast movements with simple tasks and then gradually increase the complexity of the tasks.
	Physical Guidance	This helps the trainee to get the correct feel, e.g. guiding the trainee's hand so that the correct speed, angle and distance to move an electric arc welding torch across a steel plate is experienced.
III PERCEPTUAL SKILLS	**Discrimination**	This method initially requires trainees to make easy discriminations and gradually increases the difficulty. It does not rely on verbal descriptions, but encourages the trainees to develop their own perceptions of the differences. Discrimination can also be helped by the use of industrial magnifiers.
	Cueing and Fading	Differences are spotlighted by cues such as colour and labels. These are gradually withdrawn as the trainee progresses, e.g. colour coding of the typewriter keys to indicate correct fingers.

Note: Other methods, examples and references are given in the I.T.R.U. Publication TR1 CRAMP A Guide to Training Decisions.

Appendix III

QUIZ

When would you deal with the following errors made by trainees, and why would you deal with them at that stage?

1. An electric arc welding Instructor is about to demonstrate a run when he notices that his trainee is not using his face mask.

2. A trainee market gardener misjudges the distance he should leave between each cabbage plant whilst planting out seedlings.

3. A carpentry trainee is holding his saw incorrectly.

4. The instructor notices that a trainee typist has set her right hand margin stop too close to the edge of the paper.

5. A driving instructor notices that the new trainee is slightly oversteering on a corner.

6. On his first day Jack starts to clear the swarf from his lathe with his hand.

7. Shop assistants are being trained to calculate VAT. One trainee calculates it by dividing when he should be multiplying.

8. A trainee baker is preparing to bake his bread before it has finished rising.

9. George the fork truck operator leaves his keys in the truck ignition.

10. A trainee instructor is giving a short demonstration lecture but is using visuals which are too complex for him to explain in the time.

11. After changing a tyre on a car the mechanic screws the wheel nuts back on, unjacks the car and fails to give the wheel nuts an extra turn before replacing the hub caps.

12. A trainee switchboard operator, whilst dealing with an incoming call for the first time is slow in connecting the caller with the person he wishes to speak to.

13. A cable former, learning to use a gun to tighten and trim the tie wraps, fails to clip off the surplus ends.

14. The instructor notices that one of the trainee typists starts his letter too near the top of the page.

15. A trainee bricklayer fixes his string marking line by eye, but his Instructor can see that it is at an angle.

16. Peter the trainee chef fails to dampen the edges of his pastry before putting the top crust on a pie.

17. Joe is not holding the cloth correctly. He has his right thumb on top of the cloth as he feeds it through the sewing machine.

18. A trainee motor mechanic is about to adjust the radiator hose with the car engine running.

19. Driving along a quiet stretch of straight road Harry the trainee bus driver approaches the traffic lights, which have been green for some time, without preparing to stop.

20. Andrew is training to be a Fleet Air Arm observer. His instructor notices that he is calculating from the true north instead of from the magnetic north.

ANSWERS TO THE QUIZ

ERROR	WHEN?	WHY AT THAT STAGE?
1	Immediately	It could endanger the trainee's eyesight if he was allowed to observe unprotected the flash of a welding torch.
2	Immediately	If the trainee is not helped to judge the correct distance more accurately his lack of perception is likely to cause the error to recur as he completes the row.
3	Immediately	So that the trainee will not practise a wrong method of *handling* equipment.
4	Delay	So that the trainee can see for himself and *understand* the importance of setting an adequate margin.
5	Ignore	In the early stages of training, the driver has so much to think about that a minor error, such as this, is best ignored.
6	Immediately	To prevent the *danger* of the trainee cutting his hand on the swarf.
7	Delay	Because a comparison of the correct amount of VAT, with the amount which the trainee calculates, could be used to help the trainee to discover what he has done wrong and to *understand* how to make the calculation correctly in future.
8	Immediately	Because until the trainee learns to *perceive* the difference between sufficiently and insufficiently risen dough he can only 'guess' when his mixtures are ready to bake.
9	Immediately	Because removal of the keys whenever a truck is left is a part of the procedure which the trainee must *remember*.
10	Delay	The consequences of this error could be used to help the trainee to understand the purpose of visual aids, what was wrong with his visuals and how they needed to be improved.
11	Immediately	Because the trainee has apparently *forgotten* an item of procedure which is an important part of the

ERROR	WHEN?	WHY AT THAT STAGE?
		sequence of operations. If his memory is allowed to lapse he may fall into the habit of omitting this item and paying too little attention to the safety of vehicles which he hands over after servicing.
12	Ignore	Because it is to be expected that a trainee will need to think conciously about each step when taking the first few calls. Speed will increase as confidence grows. Any comments on initial slowness, especially if there are other points which need to be mentioned, may undermine that growth of confidence.
13	Immediately	Because the trainee will never be able to 'tighten and trim' in one operation until he is able to *manipulate* the gun correctly.
14	Delay	Because the resulting appearance of the letter on the page could be used to demonstrate spacing required for a good layout, and help the trainee to *understand* how to space future work suitably.
15	Immediately	If the trainee is not helped to judge his angles more accurately this error in *perception* is likely to recur on other courses of bricks.
16	Immediately	Because the trainee has apparently *forgotten* an item of procedure which is an important part of the sequence of operations.
17	Immediately	So that the trainee will not practise a wrong method of *handling* the material.
18	Immediately	To avoid the *danger* of the trainee trapping his hand or finger in the moving fan belt.
19	Delay	Because the consequence of the error – having to pull up suddenly or failing to reach the other side of the junction before the lights changed – could be used as a basis for discussion about the need for anticipatory behaviour and help the trainee to *understand* the implications of 'reading the road'.
20	Depends upon where the error occurs:	*Immediately* - if the trainee is airborne when it happens, to prevent a *dangerous* occurrence. *Delayed* - if it occurs during a ground exercise because comparison of his answer with the correct answer to the problem which was set, could guide him to discover what he did wrong and to *understand* better how to make the calculation correctly in future.

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